State of California

THE RESOURCES AGENCY

Department of Water Resources

BULLETIN No. 119-15

FEASIBILITY OF SERVING
THE OAK FLAT WATER DISTRICT
FROM THE STATE WATER PROJECT

DECEMBER 1965

HUGO FISHER	EDMUND G. BROWN	WILLIAM E. WARNE
Administrator	Governor	Director
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In November 1960, the California Water Resources Development Bond Act was approved by the State's electorate, paving the way for the construction of the State Water Project as the first phase of the California Water Plan. Since that time, many local water service agencies throughout the State have contracted with the State for water service from the proposed facilities. Several water agencies have been organized since November 1960 expressly for the purpose of obtaining water supplies from the state facilities for the areas they represent.

Prior to executing water supply contracts with water agencies, the Department of Water Resources makes studies of the agencies and the areas encompassed by them to determine the propriety of entering into such contracts. These studies are made with the goal of evaluating (1) each area's future demand for supplemental water supplies, (2) the legal ability of each agency in question to enter into a water supply contract with the State, (3) the engineering feasibility of providing the proposed water service, and (4) the financial ability of the agency to contract for a water supply from the State Water Project.

The results of the studies made for each agency, as described above, along with significant supporting material, are embodied in reports published by the Department of Water Resources. This bulletin is one of a series of such

publications and describes studies which led to the signing
of a contract with the Oak Flat Water District on March 23,
1965. The contract provides for the delivery of a maximum
annual entitlement of 5,700 acre-feet of water from the
California Aqueduct.

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SAN JOAQUIN DISTRICT

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CHAPTER I.   INTRODUCTION

The proponents of the Oak Flat Water District met
with Department representatives for the first time on March 19,
1962, for the purpose of obtaining a water supply from the
State Water Project. Several additional meetings were held and,
prior to December 31, 1963, the nominal closing date for nego-
tiation of contracts, the proponents indicated they desired to
contract for a water supply and would take immediate steps to
form a district. The District was formed on October 13, 1964,
and a contract between the State and the District for a maximum
annual entitlement of 5,700 acre-feet of water from the State
Water Project was executed on March 23, 1965. Presented in this
report are data which demonstrate the need for and feasibility
of the contract.

This chapter describes the history, economy, powers,
and service area of the District. In the following chapters
there are presented discussions of the potential water demand,
cost of water service from the State Water Project, and demand
for project water considering the possible limiting effect of
the cost of water. The report concludes with an analysis of
the financial feasibility of the District's purchasing water
from the State.

Department Bulletin No. 3, "The California Water
Plan"; the "Standard Provisions for Water Supply Contract"
approved August 3, 1962; Bulletin No. 132-64, "The California
State Water Project in 1964"; and water supply contracts

between the State and other agricultural contractors in the San Joaquin Valley provided the bases for negotiation of the contract with the Oak Flat Water District.

The Oak Flat Water District

The Oak Flat Water District was formed in accordance with provisions of the California Water District Law. A formation election was held on October 6, 1964, and the Stanislaus County Board of Supervisors declared the District formed on October 13, 1964.

The California Water District Law is contained in Division 13, Sections 34000 through 38501, of the California Water Code. The code describes district powers and duties and prescribes the procedures for district formation, organization, management, and financing.

Powers of the District

General. The District may acquire, construct, and operate works necessary to provide water and related drainage and reclamation (Section 35401), and also works for sewage disposal (Section 35500). Portions of the territory within the District may be formed into improvement districts (Sections 36410, 36450) or distribution districts (Section 36460) to bear the costs of certain works benefiting only those areas. Only landowners may vote in district elections (Section 34027), on the basis of one vote for each dollar of assessed valuation (Section 35003).

Contracts. The District may enter into such contracts as are necessary to carry out the purposes of the District (Section 35406). The District is given specific authority to contract with the State for the purpose of developing water supplies (Section 35851). Contracts entered into pursuant to Section 35851 must be approved by the California Districts Securities Commission (Section 35854). The District is also empowered to contract for water from the State Water Project by provisions of the Central Valley Project Act (Sections 11102, 11625, 11661, and 11662).

Fiscal. The District may obtain funds by water charges (Section 35470) and by ad valorem assessment of land, exclusive of improvements and mineral, oil, and gas rights (Section 36550 et seq., Section 37200 et seq.). Subject to varying restrictions, funds may be raised within an improvement district by water charges (Sections 23800 et seq., 36451), assessment according to benefits (Sections 23626, 36451), or ad valorem assessment (Sections 23532, 36452), and within a distribution district by water charges (Section 36522) or by assessment according to benefits (Section 36471). The District may issue both general obligation and revenue bonds (Section 35950 et seq.). The issuance of general obligation bonds must be approved by a two-thirds vote, and revenue bonds by a majority vote (Section 35155). The District may incur a short-term debt (by issuing warrants payable at a future time) without holding an election (Section 36400). General obligation bonds (Section 36151) and warrants (Sections 36408) must be

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authorized by the California Districts Securities Commission. General obligation bonds (Sections 23913, 36423, 36451) or warrants (Sections 23975, 36451) of the District for an improvement district may also be issued.

The District's Service Area

The Oak Flat Water District is located in Stanislaus County about three miles south of the city of Patterson, as shown on Plate 1, "Location of Oak Flat Water District". The District, shown in detail on Plate 2, "Oak Flat Water District", comprises 2,159 acres in six parcels within a three-by-six mile area in the vicinity of the California Aqueduct. The parcels lie both below and above the Aqueduct at elevations ranging from 180 feet in the eastern portions of the District to about 400 feet adjacent to hills bordering the western portions of the District.

The Southern Pacific Railroad and State Highway 33 are located about one mile east of the District at the nearest point. The Westside Freeway will be parallel to and within a quarter-mile of the Aqueduct but will bypass the parcels of the District. The Aqueduct will traverse two of the parcels in the District.

The area adjacent to the District is intensively farmed, and it comprises a number of water districts which receive water from the Delta-Mendota Canal. About 540 acres of land in the District are presently irrigated by ground water and an additional 1,370 acres are dry-farmed. This development and livestock grazing are the only economic activities in the

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District. The present population in the District is small and it is anticipated that its future growth will be nominal.

Although no climatological data have been published for locations in the District, the following characteristics have been estimated from records of nearby U. S. Weather Bureau stations. Annual precipitation averages about 10.5 inches. Temperatures range from an average daily maximum of about 98° Fahrenheit in the month of July to an average daily minimum of about 35° Fahrenheit in January.

<div align="center">

Water Supply Available
From the State Water Project

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The minimum project yield, i.e., the dependable annual supply of project water to be made available to contractors under the Standard Provisions for Water Supply Contracts, is estimated to be 4,230,000 acre-feet annually. As of February 19, 1965, when the water supply contract between the State and the Oak Flat Water District was in the final negotiation stage, the maximum annual entitlements under all contracts executed by the State totaled 4,200,700 acre-feet annually. Thus at that time a total of 29,300 acre-feet of water was available for contracting with the District.

In addition to annual entitlements under water supply contracts, surplus water will be available from the project. The amounts of surplus water assumed to be delivered to the District on an irrigation demand schedule are shown in column 3 of Table 6, "Financial Analysis, Oak Flat Water District" (bound at end of report).

CHAPTER II. POTENTIAL WATER REQUIREMENT

Presented in this chapter are discussions of the factors affecting agricultural water demand and an estimate of the potential water requirement in the Oak Flat Water District based on a consideration of land classification, market outlook, and unit values of applied water, but disregarding the cost and availability of water. The cost of water is considered in Chapter III, and the payment capacity of crops is considered and compared with the cost and availability of water in developing the demand for project water in Chapter IV.

Presented first in this chapter are land classification data, a discussion of market outlook, and estimates of unit values of applied water. These are followed by a determination of the potential requirement for water and an analysis of the present water supply. The chapter concludes with a determination of the potential requirement for imported water calculated as the difference between the total potential requirement and the present water supply.

The urban water requirement has been omitted because of its relative insignificance since the present population in the District is small and it is anticipated that its future growth will be nominal. Therefore, the entire potential requirement determined herein is agricultural.

Agricultural Water Demand Factors[1]

Classification of Land

A land classification survey was conducted by the Department of Water Resources in the San Joaquin Valley during the period 1956-61. Table 1, "Classification of Land in Oak Flat Water District", is based on data obtained from that survey.

TABLE 1

CLASSIFICATION OF LAND IN
OAK FLAT WATER DISTRICT
(In gross acres)

Valley Land of Excellent Quality[a]	Valley Land of Medium Quality[b]	Sloping Land[c]	Non-irrigable Land[d]	Total
1,655	127	361	16	2,159

a/ Land classified as V.
b/ Land classified as Vp.
c/ Land classified as H, Hp, and Mp.
d/ Land classified as N.

Note: For definitions of land classification symbols see the Department of Water Resources' "Report on Proposed Belridge Water Storage District, Kern County", December 1961.

Market Outlook

In an office study prepared in 1958 entitled "Market Outlook for Selected California Crops, 1960-2020", the Department estimated future demand for specialty farm products grown in California. That study was used as a guide, together

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[1] For additional information concerning these factors, see "Appendix to Final Report, General Evaluation of the Proposed Program for Financing and Constructing the State Water Resources Development System of the State of California, Department of Water Resources", October 1960, by Charles T. Main, Inc.

with other criteria, in projecting the tentative crop pattern
for the District after the lands are fully developed. This
determination took into consideration the historical shifts in
the production of crops among different producing areas in
California.

Tentative Crop Pattern

The established irrigated areas located adjacent to
the District have a long history of crop production. Specialty
crops such as deciduous fruits, nuts, and vegetables in these
areas have been grown successfully under the influence of favorable
soil, climate, and economic conditions. These factors were
taken into consideration, along with the views of local
agricultural authorities and the operators who will farm the
land in the District, in projecting a tentative crop pattern.
The crop pattern is shown in Table 2, "Tentative Crop Pattern
in Oak Flat Water District".

The acreage shown in Table 2 is the net acreage of
irrigable land in the District after making reductions in the
gross areas reported in the land classification table for por-
tions of the irrigable land that would be unfarmed and occupied
by such features as the Westside Freeway, the California
Aqueduct, farm lots, roads, and creeks.

TABLE 2

TENTATIVE CROP PATTERN
IN OAK FLAT WATER DISTRICT

Crop	:	Net Acres
Almonds		190
Apricots		200
Beans, dry lima		800
Beans, green baby lima[1]		175
Sugar beets[1]		175
Tomatoes, canning		350
Walnuts		100
TOTAL		1,990

1/ Green baby lima beans represent a group of short season fall-
    winter and spring-summer truck crops. It is assumed that
    350 acres will be double-cropped to truck crops one year and
    planted to sugar beets in rotation the following year. For
    purposes of calculation half this acreage is tabulated for
    each crop each year.

Unit Values of Applied Agricultural Water

Estimated unit values of applied water for crops pro-
jected in the District are tabulated in Table 3, "Unit Values of
Applied Water for Crops Projected in Oak Flat Water District".

Potential Water Requirement

There is an estimated potential water requirement of
about 5,700 acre-feet in the Oak Flat Water District. This
amount is the approximate sum of the products of the crop acreages
in Table 2 and the appropriate unit values of applied water in
Table 3. The determination of this quantity is based on

TABLE 3

UNIT VALUES OF APPLIED WATER FOR
CROPS PROJECTED IN OAK FLAT WATER DISTRICT

Crop	Acre-feet of Water Per Acre of Irrigated Land
Almonds	3.0
Apricots	3.0
Beans, dry lima	2.5
Beans, green baby lima (double cropped)[1]	3.6
Sugar beets	2.7
Tomatoes, canning	3.3
Walnuts	3.0

[1] Green baby lima beans represent a group of short season
fall-winter and spring-summer truck crops.

consideration of the previously described agricultural water
demand factors, but it disregards the economic factor of water
cost and the availability of water.

Present Water Supply

For all practical purposes, there is no usable local
surface supply available to the District. The presently
irrigated land in the District is dependent upon ground water
for its supply. District representatives have indicated that
yields of the wells are relatively small and water quality is
poor. For these reasons they plan that the use of ground
water will be discontinued when state water is available.

Potential Requirement for Imported Water

The potential requirement for imported water in the District is equal to the potential water requirement since the use of ground water will be discontinued. The estimated potential requirement in the District for imported water from the California Aqueduct, under full development, is thus 5,700 acre-feet annually.

CHAPTER III. COST OF WATER SERVICE
FROM THE STATE WATER PROJECT

The cost to the Oak Flat Water District for water service from the State Water Project is dependent upon the allocation to the District of its share of the costs of the project facilities for conservation and transportation plus the cost for local conveyance and distribution of water. The State Water Project will be constructed by the State primarily with funds provided under terms of the California Water Resources Development Bond Act.[1] A local conveyance and distribution system or systems will be constructed and financed by the District or the individual landowners. It is not known who will own and operate these facilities, but in this report it is assumed that the District will distribute the water, incur all operation and maintenance costs, and collect therefor from the water users.

Cost of State Water

Under terms of the Department's Standard Provisions for Water Supply Contract, each contracting agency will be charged for such quantities of project water as it is entitled to receive each year. In addition, charges will be made for surplus water which will be available to each agency under certain conditions.

[1] Chapter 8, commencing with Section 12930, of Part 6 of Division 6 of the Water Code.

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Cost of Entitlement Water

Charges under the contracts are made to secure payment of reimbursable costs of the project conservation works and project transportation facilities necessary to deliver water. Charges for these purposes are called, respectively, the Delta Water Charge and the Transportation Charge.

Delta Water Charge. Under the provisions of Article 22[2/], every contractor for project water will pay the Delta Water Charge as an annual charge per acre-foot of project water included within its annual entitlement for the respective year. This charge, together with revenues derived from power generated in connection with the operation of project conservation facilities, will return to the State all reimbursable costs of the conservation facilities over the project repayment period.

The Delta Water Charge is established at a rate of $3.50 per acre-foot through the year 1969 and is estimated to be $5.46 per acre-foot for the period 1970 through 1977, and $7.34 per acre-foot thereafter until supplemental conservation facilities, as defined in the standard provisions, are constructed. Estimated charges for this component for the demand buildup included in the contract with the District are included in Table 4, "Summary of Annual Charges to Oak Flat Water District for Water From the State Water Project".

[2/] All article references are to articles of the "Water Supply Contract Between the State of California and Oak Flat Water District" dated March 23, 1965.

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TABLE 4

SUMMARY OF ANNUAL CHARGES TO OAK FLAT WATER DISTRICT
FOR WATER FROM THE STATE WATER PROJECT
(In dollars unless otherwise noted)

Calendar Year	Annual Entitlements (In acre-feet)	Allocated: Transportation Capital Costs	Transportation Charge: Capital Cost Component	Minimum OMP & R Component	Variable OMP & R Component	Total Transportation Charge	Delta Water Charge	Total Water Charges
1965	0	63,900	0	0	0	0	0	0
66	0	44,000	0	0	0	0	0	0
67	0	35,900	0	600	0	600	0	600
68	2,300	2,000	3,500	2,100	3,400	9,000	8,100	17,100
69	2,500	0	3,800	2,100	3,800	9,700	8,800	18,500
70	2,600	0	3,900	2,100	3,700	9,700	14,200	23,900
71	2,800	200	4,200	2,200	3,400	9,800	15,300	25,100
72	2,900	300	4,400	2,100	2,600	9,100	15,800	24,900
73	3,100	3,700	4,700	2,100	2,500	9,300	16,900	26,200
74	3,200	3,700	4,900	2,200	3,700	10,800	17,500	28,300
75	3,400		5,200	2,200	4,000	11,400	18,600	30,000
76	3,500		5,300	2,300	5,200	12,800	19,100	31,900
77	3,700		5,600	2,400	6,100	14,100	20,200	34,300
78	3,900		5,900	2,400	6,800	15,100	28,600	43,700
79	4,000		6,100	2,400	7,400	15,900	29,400	45,300
80	4,200		6,400	2,500	8,100	17,000	30,800	47,800
81	4,300		6,500	2,500	8,300	17,300	31,600	48,900
82	4,500		6,800	2,500	8,800	18,100	33,000	51,100
83	4,600		7,000	2,500	8,900	18,400	33,800	52,200
84	4,800		7,300	2,500	9,400	19,200	35,200	54,400
85	4,900		7,400	2,500	9,500	19,400	36,000	55,400
86	5,100		7,700	2,300	7,700	17,700	37,400	55,100
87	5,200		7,900	2,300	7,700	17,900	38,200	56,100
88	5,400		8,200	2,300	7,800	18,300	39,600	57,900
89	5,600		8,500	2,300	8,200	19,000	41,100	60,100
1990-2039	5,700		8,600	2,300	8,500	19,400	41,800	61,200
TOTALS	371,500	153,700	561,200	166,400	562,000	1,289,600	2,659,200	3,948,800
EQUIVALENT UNIT RATES (In dollars per acre-foot)		1.52	1.52	0.52	1.52	3.56	6.83	10.39

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Transportation Charge. In addition to the Delta
Water Charge, contractors receiving water from the State Water
Project will pay for the construction and operation of the
transportation facilities. Articles 23 through 28 govern the
determination of the transportation charge.

The allocation to each contractor of costs comprising
the three components of the transportation charge is made on a
proportionate-use-of-facilities basis. The capital cost and
the minimum, or fixed, operation, maintenance, power, and
replacement costs are allocated on the basis of the maximum
annual entitlement and peaking capacity provided for the
contractor within each reach of the aqueduct which would be
used to convey water to the contractor. The variable operation,
maintenance, power, and replacement costs are allocated on the
basis of the contractor's share of water delivered through
each reach of the aqueduct during each year.

The project transportation facilities that would be
used to provide water to the Oak Flat Water District are the
portions of the California Aqueduct from the Sacramento-San
Joaquin Delta to Orestimba Creek. The elevation of the water
surface in the California Aqueduct is approximately 232 feet
at the District's northernmost proposed turnout north of
Salado Creek and approximately 231 feet at the southernmost
proposed turnout north of Davis Road.

The total transportation capital cost allocated to
the District is estimated to be $153,700 for a maximum annual

entitlement of 5,700 acre-feet at a maximum monthly peaking rate of 18 percent.

Under the standard method of payment set forth in Article 24(c) of the contract, the construction, or capital, cost component of the transportation charge allocated each year to a contractor would be paid in 50 equal annual payments of principal and interest. Payment at a unit rate per acre-foot of water delivered which will repay all costs with interest during the project repayment period is a permissible modification of the method set forth in Article 24(c), and is the method of payment provided for in Article 45(c). The unit rate is estimated to be $1.52 per acre-foot for the annual entitlements set forth in the District's contract. Payment at this rate commencing in the initial year of water delivery would repay all principal and interest, at the project interest rate compounded annually, of estimated project transportation capital costs allocated to the District within the project repayment period. The project interest rate will depend upon the actual interest rates for bonds to be sold under the Water Resources Development Bond Act. The project interest rate is assumed herein to be four percent per annum.

Estimated annual values of the components of the Transportation Charge for deliveries to the District are shown in Table 4.

The determination of charges under the contract, as described above and as summarized in Table 4, does not result in a uniform charge per acre-foot of entitlement water

throughout the repayment period. Since major portions of the total charge are on a unit rate basis, however, the total charge is fairly uniform. Equivalent unit rates of components of the total charge have been computed for the purposes of comparison. These are shown in Table 4. The equivalent unit rate is defined as that constant charge which, when assessed against each acre-foot of delivery during the entire repayment period, will produce an amount by the end of the period equivalent to the sum of the annual charges which would have been assessed under the method set forth in Article 24(c), together with interest computed at the project interest rate. The total estimated equivalent unit rate for service of annual entitlements to the District is $10.39 per acre-foot at canalside as shown in Table 4.

Cost of Surplus Water

Article 21 of the contract provides that if during any year the supply of project water, after appropriate allowance for holdover storage, exceeds the total of annual entitlements of all contractors for that year, the State shall offer to sell and deliver such surplus water for periods expiring not later than the end of such year. The article also provides that the charge for surplus water shall be at least equal to the variable operation, maintenance, and power costs incurred in service for such water. This would include variable charges for both the conservation and transportation facilities.

Article 21 is modified by Article 45(a) to provide that surplus water will be allocable to the District for agricultural

and ground water replenishment use on the basis of the amount
of entitlement water it so uses. Such surplus water will be
furnished at prices which will return to the State the
variable operation, maintenance, power, and replacement com-
ponents of the Delta Water Charge and Transportation Charge
incurred in the service of such water. Contracts made pursuant
to such modification of Article 21 may exceed one year in
duration.

The unit rate for surplus water which could be
supplied for agricultural and ground water replenishment use
in the District is estimated to range from $2 to $3 per acre-
foot. It is estimated that surplus water will be available
to the District on an irrigation demand schedule through 1990.

The equivalent unit rate for delivery of combined
project water to meet annual entitlements and surplus water
is about $9 per acre-foot over the repayment period for the
contracted annual entitlements shown in column 2 and the
assumed deliveries of surplus water shown in column 3 of
Table 6.

Surcharge

A surcharge equivalent to the power credit per
acre-foot of water will be made for project water put to
agricultural or manufacturing use on excess land. This sur-
charge is provided for in Article 30 of the standard contract
provisions, and is established as $2 per acre-foot until all
of the facilities for generation of electrical energy in
connection with the operation of initial project conservation

facilities are installed and in operation. Each year there-
after the State shall redetermine the power credit per acre-
foot of water. Excess land is defined as that part of any
land in excess of 160 acres in single beneficial ownership,
or 320 acres in joint ownership by husband and wife. The
surcharge would be applicable to surplus water and to project
water delivered under the District's annual entitlements.

Surcharge Credit

Under terms of Article 45(b), the State may allow a
credit to the contractor not to exceed the surcharge to be
paid by such contractor, which credit shall be utilized to
reduce the cost of water for agricultural use on other than
excess land at a uniform rate not to exceed $2 per acre-foot.

Cost of Local Conveyance and Distribution

A locally constructed and financed conveyance and
distribution system or systems will be required to convey
water from the California Aqueduct to areas of use within the
District. A preliminary design for an irrigation conveyance
and distribution system has been made for purposes of esti-
mating costs. This system is essentially that proposed by
District representatives and consists of facilities to con-
vey water from four turnouts on the aqueduct to the highest
points in the areas of use. It is assumed for purposes of
calculation that the District would operate and maintain the
system.

The California Aqueduct will traverse two of the parcels in the District. These parcels generally lie at lower elevations than the aqueduct and are assumed not to require facilities other than on-farm distribution networks. The four other parcels, however, will require facilities to pump and convey water from the aqueduct. The estimated capital cost for the conveyance and distribution system, including pumping plants, is about $385,000. The estimated cost of the turnout structures is about $80,000. The cost of turnout structures must be paid to the State prior to their construction.

Annual costs for the conveyance and distribution system, including debt service at 5 percent over 40 years, and operation, maintenance, power, administration, and replacement costs are about $37,500. It is assumed that capital costs would be repaid by the end of the 40-year period. From then on the costs would be about $15,000 annually for operation, maintenance, power, administration, and replacement.

The equivalent unit rate for the conveyance and distribution system over the 40-year repayment period is about $7.00 per acre-foot. The equivalent unit rate over the 72-year project repayment period is about $6.26 per acre-foot.

CHAPTER IV. DEMAND FOR PROJECT WATER

Presented in this chapter are the relevant economic factors and data used to determine project water demand, an estimate of the demand, and a determination of the buildup of demand in the Oak Flat Water District. The purpose of studying these matters is to determine to what extent the farming of land in the District could support the purchase of the "potential requirement for imported water" which was developed in Chapter II.

Payment Capacity of Crops

In this report, payment capacity is defined as the amount which is available from gross crop revenues to pay water costs after deducting all other farm production expenses. The appraisal of crop payment capacity per acre-foot of water involves the consideration of crop yields, prices received, crop production costs, and other factors related thereto. These factors are briefly discussed and a payment capacity determination is presented in the following paragraphs.

Crop Yields

Crop yields used in this payment capacity analysis were developed following review of agricultural reports by the Stanislaus County Agricultural Commissioner's office, Stanislaus County Farm Advisors, and other local authorities. The adopted yields represent the county averages for the base period 1952-56, modified to reflect soil and climatic factors in the District.

Prices Received

The prices of farm products used in this analysis are essentially the averages of prices received by Stanislaus County farmers during the 1952-56 period. This information was obtained from the Agricultural Commissioner's reports and conferences with local authorities.

Crop Production Costs

Crop production costs are computed on a per-acre basis, using the estimated average unit prices paid during the 1952-56 period for the factors of production, including interest, taxes, and wages. These unit prices are applied to all labor, equipment, and materials, except water, used in production; cash overhead, such as taxes, repairs, and general expenses; all interest and depreciation; and management charges.

In addition, the crop production costs include an allowance for occasional losses attributable to inclement weather and adverse market conditions.

Drainage

The Oak Flat Water District is located in an area made up of alluvial fans which are moderately permeable and essentially have free subsurface drainage.

Payment Capacity Determination

Estimated crop production costs on a per-acre basis for each of the projected crops shown in Table 3, excluding cost of water, were deducted from the gross income values derived from crop yields and prices received, to establish the

payment capacity per acre of each crop. Payment capacities
at the farm headgate for the projected crops are shown in
Table 5, "Estimated Annual Payment Capacities for Oak Flat
Water District".

Economic Demand for Water

An analysis of these payment capacities indicates
that for each of the projected crops the payment capacity is
greater than the average water toll assumed in a financial
analysis of a possible mode of operation of the District,
which is discussed in Chapter V. The tolls assumed to be
charged to water users by the District for delivery of water
to farm headgates average $16.51 per acre-foot during the
period 1968-1990, whereas the minimum payment capacity in
Table 5 is $18.30 per acre-foot. Thus, the estimated economic
demand for project water is equal to the potential requirement
for imported water, or approximately 5,700 acre-feet per year.
This amount could be supplied since, as was discussed in
Chapter I, more than this amount of water was available for
contracting with the District at the time of final contract
negotiations.

Water Demand Buildup

In this report the District's request for water
demand buildup was used. It is believed that the District
can utilize water at this rate. The projected rate of demand

TABLE 5

ESTIMATED ANNUAL PAYMENT CAPACITIES
FOR OAK FLAT WATER DISTRICT

Crop	Projected Crop Acreage Under Full Development (In acres)	Water Requirement (In acre-feet per acre)	Water Requirement (In acre-feet)	Payment Capacity (Per acre-foot)	Cumulative Water Requirement (In acre-feet)
Beans, dry lima	800	2.5	2,000	$28.10	2,000
Apricots	200	3.0	600	26.20	2,600
Beans, green baby lima, double cropped	175	3.6	600	26.07	3,200
Walnuts	100	3.0	300	24.40	3,500
Sugar beets	175	2.7	500	22.40	4,000
Almonds	190	3.0	600	21.60	4,600
Tomatoes, canning	350	3.3	1,100	18.30	5,700
TOTALS	1,990		5,700		

buildup for entitlement water to the 1990 quantity is
presented in column 2 of Table 6. The amounts of surplus
water assumed to be delivered on an irrigation demand schedule
are shown in column 3 of Table 6.

CHAPTER V. FINANCIAL FEASIBILITY

The previous chapter indicates there is an estimated economic demand for 5,700 acre-feet of state water to irrigate land in the Oak Flat Water District. As previously indicated the District has contracted for a maximum annual entitlement of 5,700 acre-feet. Presented in this chapter is an analysis which demonstrates the feasibility of a plan for the payment by the District of a long-term debt which must be undertaken to purchase water under the contract and deliver the water to the users' headgates.

Although the cost of the water to the District will be relatively high, it is shown in Table 6, "Financial Analysis, Oak Flat Water District", that the District would not be unduly burdened under the assumed plan by its debt incurred for purchase, conveyance, and distribution of water during the project repayment period.

The analysis indicates that the District could meet, on a year-to-year basis, the cost of project water and the cost to convey and distribute the water to the land. It is believed that the information presented herein justifies the contract between the State and the District.

Financial Analysis

The various factors entering into the financial analysis are discussed in the following paragraphs. The analysis is presented in Table 6.

Water Toll

A water toll method of recovering water costs has been utilized in this analysis. Assumed District water tolls for annual entitlements and surplus water are shown in columns 5 and 7 of Table 6. During the period from 1968 to 1972, a toll of $20 per acre-foot for delivery of entitlement and regulated surplus water has been assumed to recover all costs, including the costs of turnout structures, and to provide excess revenue to insure against deficit spending in 1971 and 1972, when surplus water is not expected to be available.

For the period 1973 through 2007, a toll of $15.80 per acre-foot for delivery of entitlement and surplus water has been assumed to provide a year-end balance of $31,600 by 2007. A maximum year-end balance of $157.100 resulting from revenues in excess of costs, including interest at four percent, is generated by 1982. For the period 2008 through 2026, a toll of $13.15 per acre-foot for delivery of entitlement water has been assumed to hold the year-end balance constant during this period. For the period 2027 through 2038 a toll of $12.85 per acre-foot has been assumed to allow total revenues to equal total cost by the end of 2039.

Assessed Valuation and Bonded Indebtedness

The 1964-65 assessed valuation of the District is $148,560. The District has no bonded indebtedness at the present time. There is also no bonded indebtedness assigned to the area from overlying or coterminous units.

Financial Analysis Table

Presented in Table 6 is a year-by-year summary of the assumed revenues from sale of water by the District; the costs which would be charged to the District by the State for annual entitlements and surplus water; the costs which would be incurred by the District for conveyance and distribution of state water; the difference between revenues and costs or the net operating revenues; and the balance of funds remaining at the end of the year.

The capital cost for the turnout structures and measuring devices from the California Aqueduct must be paid prior to the start of construction. It is estimated that this cost will be $80,000, which will be due in 1965. In this analysis, it has been assumed that the District would pay this cost in a lump sum financed from a short-term loan.

Although the net revenues are assumed to accumulate interest during the early years of the project, these funds might be used to finance partially the construction of the conveyance and distribution facilities.

The financial analysis contains assumptions as to matters which are in the province of the Board of Directors of the Oak Flat Water District. It is believed, however, that the assumptions employed herein are sufficiently representative to demonstrate that not only is the suggested program financially feasible but that it would remain so with reasonable variation in the assumptions.

An explanation of the column headings of the financial analysis table follows:

Explanation of Column Headings in Table 6

Column Number	Explanation
1	Years of the period of analysis commencing in year 1965, the year in which payment for the turnout structures and measuring devices is assumed to be made, and terminating in 2039, the assumed end of the 50-year repayment period following final project construction.
2	Delivery of annual entitlement water. The total demand and the rate of demand buildup are those negotiated by the Department and the District, and appear in Table A of the contract between the District and the State.
3	Annual delivery of surplus water on an irrigation demand schedule. Its use terminates after 1990, the estimated last year of availability of such surplus water.
4	Total annual delivery to the District. (Sum of columns 2 and 3.)
5	Assumed tolls for entitlement water to all users in the District at farm headgate.
6	Total revenue from delivery of annual entitlements of water. (Product of columns 2 and 5.)

Column Number	Explanation
7	Assumed tolls for surplus water to all users in the District at farm headgate.
8	Total annual revenue from delivery of surplus water on an irrigation demand schedule. (Product of columns 3 and 7.)
9	Total annual revenue from delivery of both types of water. (Sum of columns 6 and 8.)
10	Annual repayment requirements for annual entitlements delivered at canalside to be paid to the State from Table 4.
11	Estimated cost per acre-foot of delivering surplus water at canalside on an irrigation demand schedule.
12	Total annual cost of delivering surplus water at canalside on an irrigation demand schedule. (Product of columns 3 and 11.)
13	Total annual cost of delivering both types of water at canalside. (Sum of columns 10 and 12.)
14	Total annual local conveyance and distribution costs based on peak demand of 18 percent and 40-year repayment period at five percent interest.

Column Number	Explanation
15	Total annual cost of delivering both types of water to the farm headgate. (Sum of columns 13 and 14.)
16	Difference between cost of delivering both types of water to the farm headgate and estimated revenue received by the District from the sale thereof. (Column 9 less column 15.)
17	Balance of available funds from previous year plus net operating revenue collected in current year. (Sum of column 19 of previous year and column 16 of current year.)
18	Interest earning on balance of District funds. (Product of .04 and column 17.)
19	Balance of funds available to District at end of each year. (Sum of columns 17 and 18.)

CHAPTER VI.   SUMMARY AND CONCLUSIONS

The pertinent information presented in this report
is summarized and conclusions are presented in the following
sections.

Summary

The Oak Flat Water District, comprising 2,159 acres
in Stanislaus County, was formed in 1964 for the express
purpose of obtaining an irrigation water supply from the State
Water Project. It may contract with the State for a water
supply, construct and operate conveyance and distribution
facilities to deliver said supply, and obtain funds by water
charges and by ad valorem assessments.

About 540 acres in the District are presently irrigated
by ground water and an additional 1,370 acres are dry farmed.
This development and livestock grazing are the only economic
activities in the District. It is expected that the purchase of
water from the State will enhance the economy and that it will
continue to be based on agriculture.

The minimum project yield, i.e. the dependable annual
supply of project water to be made available to contractors
under the Standard Provisions for Water Supply Contract, is
estimated to be 4,230,000 acre-feet annually. As of
February 19, 1965, when the water supply contract between the
State and the Oak Flat Water District was in the final negoti-
ation stage, the maximum annual entitlements under all contracts
executed by the State totaled 4,200,700 acre-feet annually.

Thus at that time a total of 29,300 acre-feet of water was available for contracting with the District.

There is a potential water requirement of about 5,700 acre-feet annually in the District. The determination of this quantity is based on the consideration of agricultural water demand factors but disregards the availability and cost of water.

The irrigated land in the District is dependent upon ground water for its supply at the present time. District representatives have indicated that yields of the wells are relatively small and water quality is poor. For these reasons they plan that the use of ground water will be discontinued when state water is available.

The potential requirement for imported water in the District is equal to the potential water requirement of 5,700 acre-feet since the use of ground water will be discontinued.

Water from the California Aqueduct can be provided to the District at an estimated equivalent unit rate for annual entitlements of $10.39 per acre-foot at canalside. The unit rate for surplus water used for agricultural purposes in the District is estimated to range from $2 to $3 per acre-foot. The equivalent unit rate for delivery of combined entitlement and surplus water is about $9 per acre-foot over the repayment period.

Assuming the District will construct, operate, and maintain a system to deliver water to farm headgates, the

estimated total cost to convey and distribute water, including

the capital cost and the operation, maintenance, power, admin-

istration, and replacement costs of the conveyance and

distribution system, on an equivalent unit rate basis, is

$6.26 per acre-foot during the project repayment period. In

addition, the District must pay about $80,000 for construction

of turnout structures.

Consideration of the payment capacity of crops and

the cost for purchase, conveyance, and distribution of water

indicates that the economic demand under full development in

the District is 5,700 acre-feet of project water per year.

The 1964-65 assessed valuation of the District is

$148,560. The District has no bonded indebtedness at the

present time. There is also no bonded indebtedness assigned

to the area from overlying or coterminous units.

The District will not be unduly burdened by its

obligation to pay for, convey, and distribute the supply of

water it will receive during the project repayment period

under its contract with the State.

Conclusions

1. The State of California has the necessary water

supply and the authority to enter into the contract with the

Oak Flat Water District which was signed March 23, 1965, for

the service of a maximum annual entitlement of 5,700 acre-

feet of water.

2.   The contractual cost to the District and the cost for conveyance and distribution of the water can be met with agricultural water tolls which would not exceed the ability of users to pay for water.

3.   The Oak Flat Water District has the authority, the necessity, and the financial capability to enter into the contract with the State of California for the service of a maximum annual entitlement of 5,700 acre-feet of water from the State Water Project.
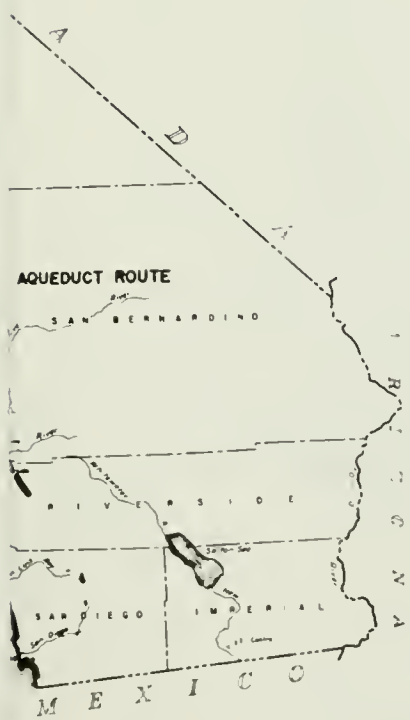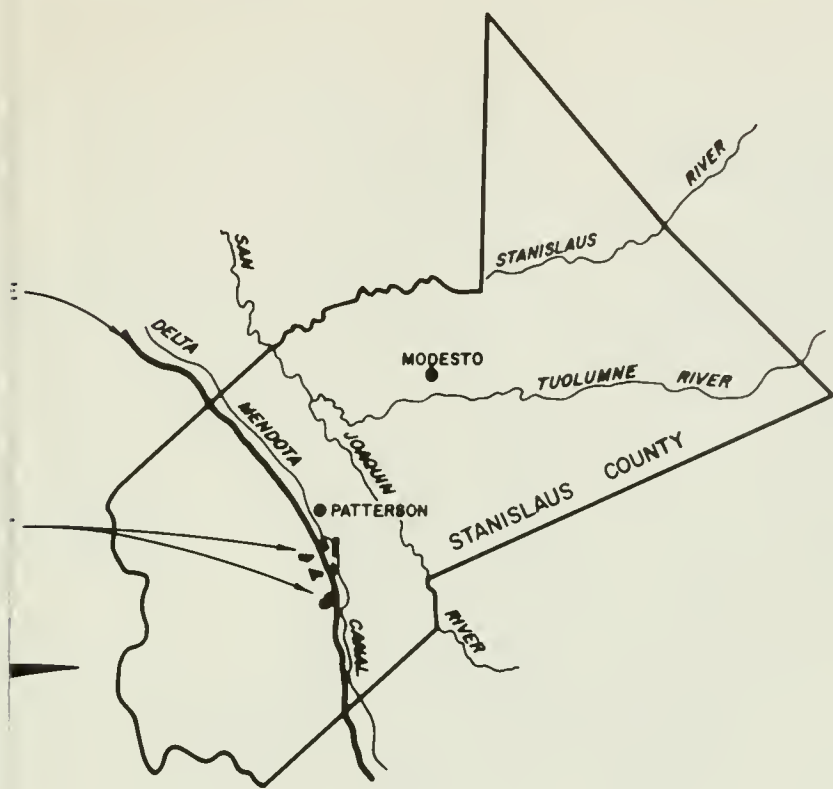
TABLE 6

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. ANALYSIS
TER DISTRICT

Costs at Canalside			Total Annual	Total Cost:		Previous Year:		
Surplus			Local Distri-	Total Cost:	Net	Balance Plus:	Interest:	Balance
Per			bution & Con-	at Farm	:Operating:	Net Operating:	at	:at end
cre-foot: Total :	Total		veyance Costs:	Headgate :	Revenue :	Revenue :	4%	:of Year
11	3x11=12	13	14	13+14=15	9-15=16	17	18	17+18=19
		$ 600		$ 600	$ -600	$-80,000*	-3,200	-83,200
						-83,800	-3,400	-87,200
$2.00	$4,000	21,100	$34,600	55,700	30,300	-56,900	-2,300	-59,200
2.03	4,300	22,800	36.100	58,900	41.100	-18.100	-700	-18.800
1.92	4,800	28.700	36.300	65,000	37.000	18.200	700	18,900
1.72	0	25.100	31.600	56,700	-700	18.200	700	18,900
1.39	0	24.900	31.800	56,700	1,300	20,200	800	21,000
1.33	2.700	28,900	36.300	65,200	15,400	36.400	1,500	37,900
1.66	4,200	32,500	37,500	70,000	20.100	58,000	2.300	60,300
1.69	3,900	33,900	37,500	71,400	18,700	79,000	3,200	82,200
2.00	4,400	36,300	37,500	73,800	16,300	98,500	3,900	102,400
2.17	4,300	38,600	37,500	76,100	14,000	116,400	4,700	121,100
2.26	4,100	47,800	37,500	85,300	4,800	125,900	5,000	130,900
2.36	4,000	49,300	37,500	86,800	3,300	134,200	5,400	139,600
2.43	3,600	51.400	37,500	88,900	1,200	140,800	5,600	146,400
2.45	3,400	52,300	37,500	89,800	300	146,700	5,900	152,600
2.46	3,000	54,100	37,500	91,600	-1,500	151,100	6,000	157,100
2.46	0	52,200	35,300	87,500	-14,800	142,300	5,700	148,000
2.46	0	54,400	35,600	90,000	-14,200	133,800	5,400	139,200
2.46	0	55,400	35,900	91,300	-13,900	125,300	5,000	130,300
2.02	1,200	56,300	37,500	93,800	-3,700	126,600	5,100	131,700
1.99	1,000	57,100	37,500	94,600	-4,500	127,200	5,100	132,300
1.96	600	58,500	37,500	96,000	-5,900	126,400	5,100	131,500
1.98	200	60,300	37,500	97,800	-7,700	123,800	5,000	128,800
		61,200	37,500	98,700	-8,600	120,200	4,800	125,000
		61,200	37,500	98,700	-8,600	116,400	4,700	121,100
		61,200	37,500	98,700	-8,600	112,500	4,500	117,000
		61,200	37,500	98,700	-8,600	108,400	4,300	112,700
		61,200	37,500	98,700	-8,600	104,100	4,200	108,300
		61,200	37,500	98,700	-8,600	99,700	4,000	103,700
		61,200	37,500	98,700	-8,600	95,100	3,800	98,900
		61,200	37,500	98,700	-8,600	90,300	3,600	93,900
		61,200	37,500	98,700	-8,600	85,300	3,400	88,700
		61,200	37,500	98,700	-8,600	80,100	3,200	83,300
		61,200	37,500	98,700	-8,600	74,700	3,000	77,700
		61,200	37,500	98,700	-8,600	69,100	2,800	71,900
		61,200	37,500	98,700	-8,600	63,300	2,500	65,800
		61,200	37,500	98,700	-8,600	57,200	2,300	59,500
		61,200	37,500	98,700	-8,600	50,900	2,000	52,900
		61,200	37,500	98,700	-8,600	44,300	1,800	46,100
		61,200	37,500	98,700	-8,600	37,500	1,500	39,000
		61,200	37,500	98,700	-8,600	30,400	1,200	31,600
		61,200	15,000	76,200	-1,200	30,400	1,200	31,600
		61,200	15,000	76,200	-3,000	28,600	1,100	29,700
		61,200	15,000	76,200	-3,000	26,700	1,100	27,800
		61,200	15,000	76,200	-3,000	24,800	1,000	25,800
		61,200	15,000	76,200	-3,000	22,800	900	23,700
		61,200	15,000	76,200	-3,000	20,700	800	21,500
		61,200	15,000	76,200	-3,000	18,500	700	19,200
		61,200	15,000	76,200	.-3,000	16,200	600	16,800
		61,200	15,000	76,200	-3,000	13.800	600	14,400
		61,200	15,000	76,200	-3,000	11,400	500	11,900
		61,200	15,000	76,200	-3,000	8,900	400	9,300
		61,200	15,000	76,200	-3,000	6,300	300	6,600
		61,200	15,000	76,200	-3,000	3,600	100	3,700
		61,200	15,000	76,200	-3,700	0	0	0

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TABLE 6

TABLE 6

FINANCIAL ANALYSIS
OAK FLAT WATER DISTRICT

Year	Annual Water Deliveries (In acre-feet) Entitlement	Surplus	Total	Entitlement Per Acre-foot	Annual Revenues Entitlement Total	Surplus Per Acre-foot	Surplus Total	Total	Annual Costs at Canalside Entitlement Total	Surplus Per Acre-foot	Surplus Total	Total	Total Annual Local Distribution & Conveyance Costs	Total Cost at Farm Headgate	Net Operating Revenue	Previous Year Balance Plus Net Operating Revenue	Interest at 4%	Balance at end of Year
1	2	3	2+3=4	5	2x5=6	7	3x7=8	6+8=9	10	11	3x11=12	13	14	13+14=15	9-15=16	17	18	17+18=19
1965																		
66																$-80,000*	-3,200	-83,200
67									$ 600			$ 600		$ 600	$ -600	-83,800	-3,400	-87,200
68	2,300	2,000	4,300	$20.00	$46,000	$20.00	$40,000	$86,000	17,100	$2.00	$4,000	21,100	$34,600	55,700	30,300	-56,900	-2,300	-59,200
69	2,500	2,500	5,000	20.00	50,000	20.00	50,000	100,000	18,500	2.03	4,300	22,800	36,100	58,900	41,100	-18,100	-700	-18,800
1970	2,600	2,500	5,100	20.00	52,000	20.00	50,000	102,000	23,900	1.92	4,800	28,700	36,300	65,000	37,000	18,200	700	18,900
71	2,800	0	2,800	20.00	56,000	20.00	0	56,000	25,100	1.72	0	25,100	31,600	56,700	-700	18,200	700	18,900
72	2,900	0	2,900	20.00	58,000	20.00	0	58,000	24,900	1.39	0	24,900	31,800	56,700	1,300	20,200	800	21,000
73	3,100	2,000	5,100	15.80	49,000	15.80	31,600	80,600	26,200	1.33	2,700	28,900	36,300	65,200	15,400	36,400	1,500	37,900
74	3,200	2,500	5,700	15.80	50,600	15.80	39,500	90,100	28,300	1.66	4,200	32,500	37,500	70,000	20,100	58,000	2,300	60,300
1975	3,400	2,300	5,700	15.80	53,700	15.80	36,400	90,100	30,000	1.69	3,900	33,900	37,500	71,400	18,700	79,000	3,200	82,200
76	3,500	2,200	5,700	15.80	55,300	15.80	34,800	90,100	31,900	2.00	4,400	36,300	37,500	73,800	16,300	98,500	3,900	102,400
77	3,700	2,000	5,700	15.80	58,500	15.80	31,600	90,100	34,300	2.17	4,300	38,600	37,500	76,100	14,000	116,400	4,700	121,100
78	3,900	1,800	5,700	15.80	61,600	15.80	28,500	90,100	43,700	2.26	4,100	47,800	37,500	85,300	4,800	125,900	5,000	130,900
79	4,000	1,700	5,700	15.80	63,200	15.80	26,900	90,100	45,300	2.36	4,000	49,300	37,500	86,800	3,300	134,200	5,400	139,600
1980	4,200	1,500	5,700	15.80	66,400	15.80	23,700	90,100	47,800	2.43	3,600	51,400	37,500	88,900	1,200	140,800	5,600	146,400
81	4,300	1,400	5,700	15.80	68,000	15.80	22,100	90,100	48,900	2.45	3,400	52,300	37,500	89,800	300	146,700	5,900	152,600
82	4,500	1,200	5,700	15.80	71,100	15.80	19,000	90,100	51,100	2.46	3,000	54,100	37,500	91,600	-1,500	151,100	6,000	157,100
83	4,600	0	4,600	15.80	72,700	15.80	0	72,700	52,200	2.46	0	52,200	35,300	87,500	-14,800	142,300	5,700	148,000
84	4,800	0	4,800	15.80	75,800	15.80	0	75,800	54,400	2.46	0	54,400	35,600	90,000	-14,200	133,800	5,400	139,200
1985	4,900	0	4,900	15.80	77,400	15.80	0	77,400	55,400	2.46	0	55,400	35,900	91,300	-13,900	125,300	5,000	130,300
86	5,100	600	5,700	15.80	80,600	15.80	9,500	90,100	55,100	2.02	1,200	56,300	37,500	93,800	-3,700	126,600	5,100	131,700
87	5,200	500	5,700	15.80	82,200	15.80	7,900	90,100	56,100	1.99	1,000	57,100	37,500	94,600	-4,500	127,200	5,100	132,300
88	5,400	300	5,700	15.80	85,300	15.80	4,800	90,100	57,900	1.96	600	58,500	37,500	96,000	-5,900	126,400	5,100	131,500
89	5,600	100	5,700	15.80	88,500	15.80	1,600	90,100	60,100	1.98	200	60,300	37,500	97,800	-7,700	123,800	5,000	128,800
1990	5,700	0	5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	120,200	4,800	125,000
91	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	116,400	4,700	121,100
92	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	112,500	4,500	117,000
93	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	108,400	4,300	112,700
94	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	104,100	4,200	108,300
1995	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	99,700	4,000	103,700
96	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	95,100	3,800	98,900
97	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	90,300	3,600	93,900
98	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	85,300	3,400	88,700
99	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	80,100	3,200	83,300
2000	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	74,700	3,000	77,700
01	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	69,100	2,800	71,900
02	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	63,300	2,500	65,800
03	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	57,200	2,300	59,500
04	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	50,900	2,000	52,900
2005	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	44,300	1,800	46,100
06	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	37,500	1,500	39,000
07	5,700		5,700	15.80	90,100			90,100	61,200			61,200	37,500	98,700	-8,600	30,400	1,200	31,600
2008-2026	5,700		5,700	13.15	75,000			75,000	61,200			61,200	15,000	76,200	-1,200	30,400	1,200	31,600
2027	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	28,600	1,100	29,700
28	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	26,700	1,100	27,800
29	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	24,800	1,000	25,800
2030	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	22,800	900	23,700
31	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	20,700	800	21,500
32	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	18,500	700	19,200
33	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	16,200	600	16,800
34	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	13,800	600	14,400
2035	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	11,400	500	11,900
36	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	8,900	400	9,300
37	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	6,300	300	6,600
38	5,700		5,700	12.85	73,200			73,200	61,200			61,200	15,000	76,200	-3,000	3,600	100	3,700
39	5,700		5,700	12.72	72,500			72,500	61,200			61,200	15,000	76,200	-3,700	0	0	0

*Lump sum for turnout structures

PLATE I

STANISLAUS RIVER

SAN

DELTA

MENDOTA

JOAQUIN

MODESTO

TUOLUMNE RIVER

PATTERSON

STANISLAUS COUNTY
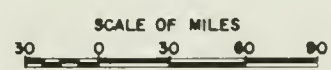
CANAL

RIVER

AQUEDUCT ROUTE

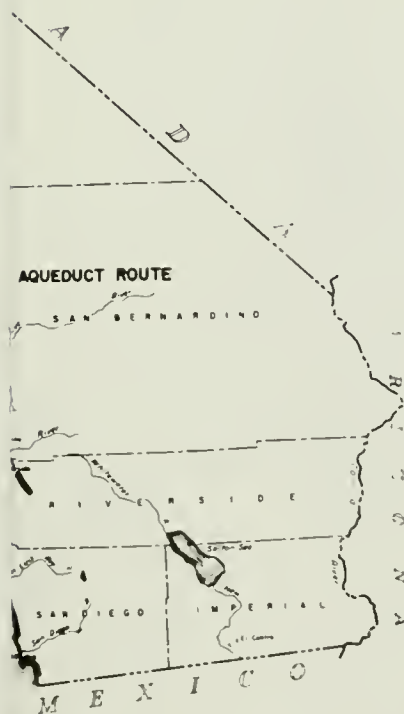SAN BERNARDINO

RIVERSIDE

SAN DIEGO

IMPERIAL

MEXICO

STATE OF CALIFORNIA

THE RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES

SAN JOAQUIN DISTRICT

FEASIBILITY OF SERVING THE OAK FLAT
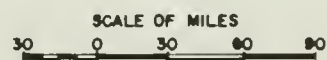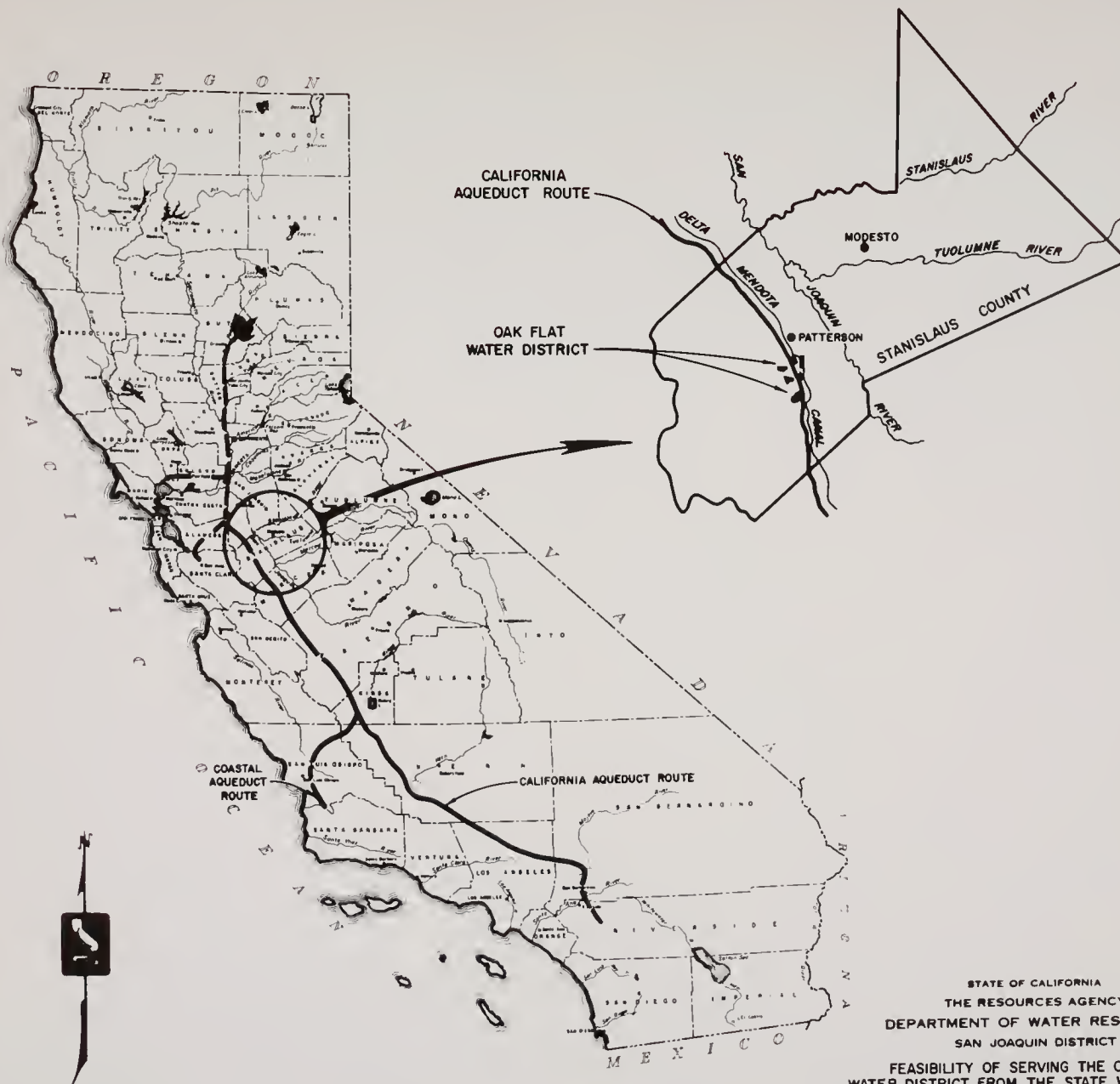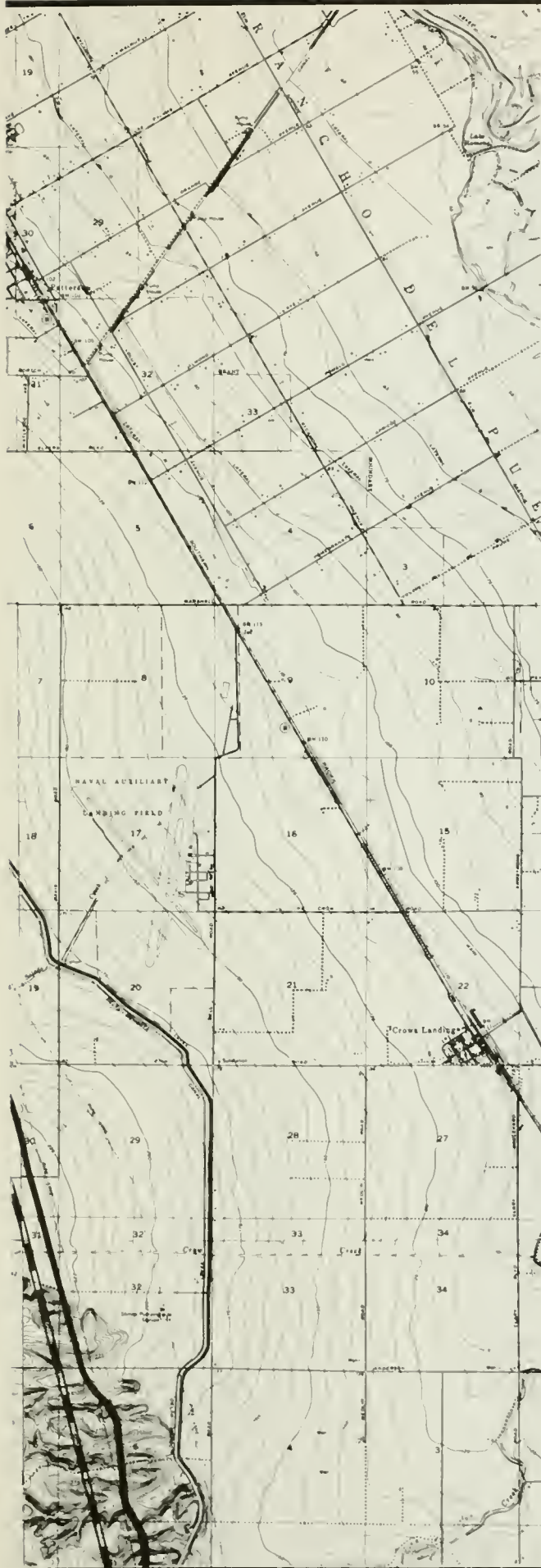WATER DISTRICT FROM THE STATE WATER PROJECT

LOCATION OF
OAK FLAT WATER DISTRICT
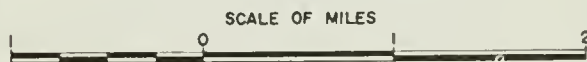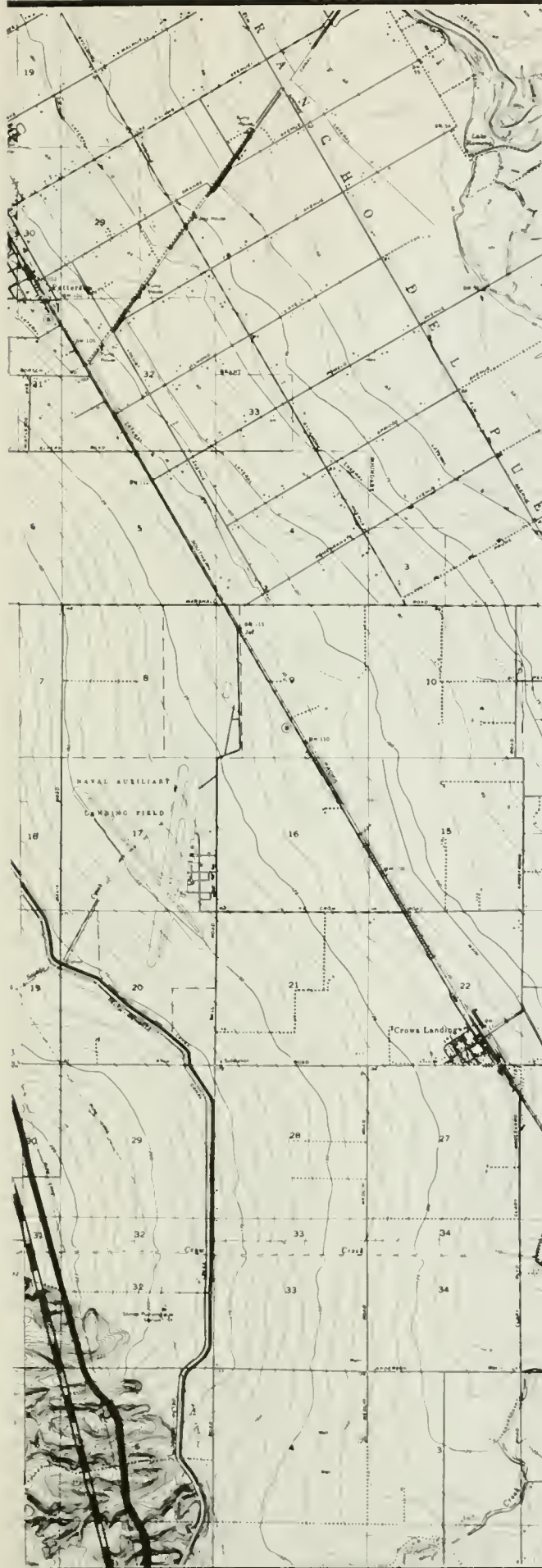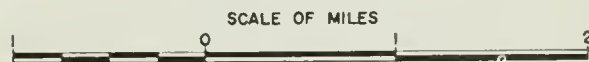1965

SCALE OF MILES

30   0   30   60   90

PLATE I

STATE OF CALIFORNIA

THE RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES

SAN JOAQUIN DISTRICT

FEASIBILITY OF SERVING THE OAK FLAT
WATER DISTRICT FROM THE STATE WATER PROJECT

LOCATION OF
OAK FLAT WATER DISTRICT
1965

SCALE OF MILES

30   0   30   60   90

PLATE I

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SAN JOAQUIN DISTRICT

FEASIBILITY OF SERVING THE OAK FLAT
WATER DISTRICT FROM THE STATE WATER PROJECT

LOCATION OF
OAK FLAT WATER DISTRICT
1965

SCALE OF MILES

PLATE 2

LEGEND

⟋⟋⟋⟋⟋⟋⟋ OAK FLAT WATER DISTRICT BOUNDARY

━━━━━━━ CALIFORNIA AQUEDUCT ALIGNMENT

━━ ━━ ━━ WESTSIDE FREEWAY ALIGNMENT

STATE OF CALIFORNIA

THE RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES

SAN JOAQUIN DISTRICT

FEASIBILITY OF SERVING THE OAK FLAT
WATER DISTRICT FROM THE STATE WATER PROJECT
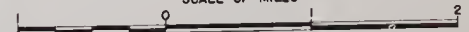
OAK FLAT WATER DISTRICT
1965

SCALE OF MILES

0   2

PLATE 2

LEGEND

⟋⟋⟋⟋⟋⟋⟋⟋⟋ OAK FLAT WATER DISTRICT BOUNDARY

━━━━━━━━━━ CALIFORNIA AQUEDUCT ALIGNMENT

━ ▬ ━ ▬ ━ WESTSIDE FREEWAY ALIGNMENT

STATE OF CALIFORNIA

THE RESOURCES AGENCY

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SAN JOAQUIN DISTRICT

FEASIBILITY OF SERVING THE OAK FLAT
WATER DISTRICT FROM THE STATE WATER PROJECT

OAK FLAT WATER DISTRICT
1965

SCALE OF MILES

1   0   1   2

PLATE 2

STATE OF CALIFORNIA

THE RESOURCES AGENCY

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SAN JOAQUIN DISTRICT

FEASIBILITY OF SERVING THE OAK FLAT
WATER DISTRICT FROM THE STATE WATER PROJECT

OAK FLAT WATER DISTRICT
1965

SCALE OF MILES